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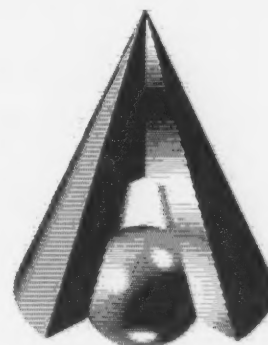
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Choice or Necessity: Do Immigrants and Their Children Choose Self-employment for the Same Reasons?

by Teresa Abada, Feng Hou, and Yuqian Lu

Social Analysis Division
24-I, R.H. Coats Building, 100 Tunney's Pasture Driveway
Ottawa, Ontario K1A 0T6

Telephone: 1-800-263-1136

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r   revised
x   suppressed to meet the confidentiality requirements of the *Statistics Act*
E   use with caution
F   too unreliable to be published
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Abstract

Immigrants in major industrialized countries are disproportionately represented in self-employment as compared to the domestic-born. However, there is no consensus regarding whether the determinants of self-employment are similar for immigrants and non-immigrants. Furthermore, little is known about whether children of immigrants are influenced by the same factors as their parents in choosing self-employment.

Using a generational cohort method and data from the 20% sample file of the 1981 Canadian Census and the 20% sample file of the 2006 Canadian Census, this study examines whether the effects of three important determinants of self-employment—expected earnings differentials between paid employment and self-employment, difficulties in the labour market, and ethnic enclaves—differ between immigrants and the Canadian-born, between children of immigrants and children of the Canadian-born, and between children of immigrants and their parents.

The results suggest that difficulties in local labour markets had a stronger "push" effect on self-employment among immigrant fathers than among Canadian-born fathers. In comparison, the expected earnings differential had a stronger effect among Canadian-born fathers than among immigrant fathers. Both sons of immigrants and sons of Canadian-born were more strongly affected by expected earnings differentials than were their parents, while difficulties in local labour markets were not a significant factor for them. The local concentration of an ethnic group was not positively associated with the self-employment rates among either immigrants or the children of immigrants. The choice of self-employment among young women, regardless of their parents' immigrant status, was strongly associated with the expected earnings differential and years of experience in 2006, while this was not so among their mothers 25 years previously.

More studies from the Social Analysis Division related to **immigration** and **labour market adjustment** are available at **Update on Social Analysis Research** (www.statcan.gc.ca/socialanalysis).

Executive summary

In the last few decades, immigrant entrepreneurship has become an important feature of labour markets in many industrialized countries. Immigrants are disproportionately represented in self-employment as compared to the domestic-born. While the burgeoning research on self-employment among immigrants underscores its importance with respect to immigrant economic integration, most studies have focused on adult immigrants. Little is known about what motivates the children of immigrants to become entrepreneurs and whether they are subject to the same forces as their parents in choosing self-employment.

Using a generational cohort approach, this paper compares some of the determinants of self-employment among immigrants and their children, including the second generation (Canadian-born children of immigrants) and the 1.5 generation (foreign-born children of immigrant parents). To situate the analyses in a broader context, the paper also examines the intergenerational change from Canadian-born parents to their children (the third-and-higher generations). The analysis addresses the following questions: (1) Were immigrant parents and Canadian-born parents affected by similar "push" and "pull" factors in choosing self-employment?; (2) Were children of immigrants and children of Canadian-born parents affected by similar "push" and "pull" factors in choosing self-employment?; and (3) Did immigrants and the Canadian-born experience similar generational changes in the determinants of self-employment? Specifically, this study examines whether the effects of three important determinants of self-employment—expected earnings differentials between paid employment and self-employment, difficulties in the labour market, and ethnic enclaves—differ between immigrants and the Canadian-born, between children of immigrants and children of the Canadian-born, and between children of immigrants and their parents. The analysis is conducted separately for men and women since the determinants of self-employment and their changing effects over generations could be different by gender.

The data used in this study are from the 20%-sample micro file of the 1981 Canadian Census of Population and the 20%-sample micro file of the 2006 Canadian Census of Population. These datasets are the only Canadian sources that allow comparisons of self-employment patterns by generational status over time. Self-employed workers are defined as individuals who identify themselves as mainly self-employed in their own unincorporated or incorporated business. The analysis is restricted to individuals aged 25-to-44 in order to permit generational comparisons in self-employment patterns between parents and their children at the same age range but 25 years apart. Workers in farming industries are excluded.

The analysis finds a substantial deterioration in the earnings of self-employment relative to paid employment from parents to children regardless of whether the parent was an immigrant. This deterioration was reflected in the expected earnings differentials when individuals switched from paid employment to self-employment. In 1980, about one fifth of male workers would have expected earnings gains when switching from paid employment to self-employment, but this was no longer the case in 2005. The association of the expected earnings differential with individuals' probability of self-employment increased from fathers to their sons. This variable was more strongly associated with the likelihood of self-employment among sons in 2005 than among fathers in 1980 for all three groups, i.e., the 1.5 generation, the second generation, and the third-and-higher generations. Cross-sectionally, this association was weaker among immigrant fathers and their sons than among Canadian-born fathers and their sons.

The "push" effect of labour market difficulty tended to decrease over time for young men. Group-specific local employment rates were associated with higher self-employment rates among fathers in all three groups, but not among their children. One possible factor accounting for the lack of association is that both the availability of self-employment opportunities and the

attractiveness of self-employment declined for young men, as evident from the substantial deterioration in self-employment earnings relative to paid-employment earnings.

Group-specific population share, a commonly-used measure of ethnic enclave, was not positively associated with self-employment among immigrant fathers and the sons of immigrant fathers.

Self-employment among young women in 2005 was strongly associated with the expected earnings differential and years of experience, while this was not so among their mothers 25 years prior. Thus, in making the choice of self-employment, young women, as did young men, took into account the expected earnings differential.

1 Introduction

Immigrant entrepreneurship has long been an important feature of labour markets in many industrialized countries. Immigrants are disproportionately represented in self-employment, as compared with the domestic-born, as evident in the United States (Lofstrom 2002; Borjas 1986), Sweden (Hammarstedt 2001), Denmark (Andersson and Wadensjö 2004), and Canada (Li 1997). Self-employment has been shown to be an important factor in reducing unemployment among immigrants, creating jobs, and developing innovative businesses (Andersson and Hammarstedt 2010). While the burgeoning research on this topic underscores the importance of self-employment for immigrants' economic integration, most studies have focused on first-generation immigrants. Little is known about what motivates the children of immigrants to become entrepreneurs and whether they do so for the same reasons as their parents.

Ascertaining the motivations for self-employment is essential for understanding the multidimensional pathways of economic integration among the Canadian-born children of immigrants (i.e., the second generation). Most studies concerning the second-generation have focused on this generation's educational attainment and outcomes in paid employment. Consequently, little is known about the determinants and characteristics of self-employment among this group and the implications of self-employment for labour market integration.

Although difficulties in the paid labour market tend to be a strong factor motivating first-generation immigrants to enter self-employment, the second generation may do so for other reasons, such as entrepreneurial aspirations or preferences for autonomy and control in daily work-life. These generational differences in intentions may represent changes in the criteria of success: for immigrant parents, success is often measured against the benchmark of what they left behind, while, for the second generation it is measured against the attainment of their counterparts in the mainstream host society (Fernandez-Kelly and Konczal 2005). The different experiences of immigrants and their children born in the host country are an important consideration in this respect. In Canada, the second generation grew up being proficient in one or both of the official languages, was educated in the Canadian educational system, and was exposed to mainstream norms and values. Moreover, the second generation of immigrants to Canada tends to obtain higher educational levels than children of Canadian-born parents; it would therefore be expected that the second generation of immigrants and the children of Canadian-born parents would have equal access to economic opportunities. It is highly plausible that "push" factors such as unemployment and language obstacles and "pull" factors such as ethnic resources may not play a salient role in the self-employment decision among the second generation of immigrants.

A companion paper finds that the second-generation men (the Canadian-born sons of immigrants) had a lower self-employment rate in 2006 than their immigrant fathers did in 1981 (Hou *et al.* 2011). However, when controls for changes in demographic factors, particularly marriage rates, presence of children, and years of work experience were applied, the self-employment rate was found to be about the same for the second-generation men and their fathers. This intergenerational change in the self-employment rate was not unique to the second generation. When changes in socio-demographic factors were taken into account, the generational succession in self-employment rates from immigrant parents to the second generation was about the same as from Canadian-born parents to their children. In contrast to the change in self-employment rates from fathers to sons, self-employment rates were found to have increased from mothers to daughters regardless of mothers' immigrant status.

Using the same generational cohort approach as that employed in the companion paper, this paper compares the correlates of self-employment among immigrants and Canadian-born individuals in different generations. The focus is on the extent to which the likelihood of being self-employed is associated with: (*i*) expected earnings differentials between self-employment

and paid employment; (*ii*) difficulties in the labour market; and (*iii*) ethnic enclaves. These three sets of variables have their roots in distinct theoretical approaches to immigrant entrepreneurship.

Three questions are addressed in the paper: (1) Are "push" and "pull" factors similarly associated with the likelihood of being self-employed among immigrant parents and Canadian-born parents?; (2) Are "push" and "pull" factors similarly associated with the likelihood of being self-employed among the children of immigrants and the children of Canadian-born parents?; and (3) Did immigrants and the Canadian-born experience similar generational changes in the correlates of self-employment?

The analysis suggests that difficulties in local labour markets had a stronger "push" effect on self-employment among immigrant fathers than among Canadian-born fathers, while expected earnings differentials had a weaker effect on immigrant fathers than on Canadian-born fathers. Among the next generation, both sons of immigrants and sons of the Canadian-born were more strongly affected by expected earnings differentials than were their parents, while difficulties in the local labour market were not a significant factor. The local concentration of an ethnic group, that is, the presence of an ethnic enclave, was not positively associated with self-employment rates among immigrants or their children.

The remainder of the paper is divided into four sections. In Section 2, the literature on immigrant self-employment is reviewed; this section highlights three main theoretical approaches to the issues. In Section 3, the data source and methods used in the paper are discussed. Results in Section 4 are presented in two sub-sections. The estimation of the earnings differential between self-employment and paid employment and trends in this differential are presented in Section 4.1. Given the importance of this issue and the methodological complexity involved, a detailed discussion is warranted. The factors associated with the probability of self-employment (including expected earnings differentials) are presented in Section 4.2. Conclusions follow, in Section 5.

2   Determinants of self-employment

In economics, entry into self-employment is often viewed as a rational choice, with individuals choosing paid employment or self-employment on the basis of which one offers them greater utility (e.g.: Borjas and Bronars 1989; Evans and Jovanovic 1989; Fairlie and Meyer 1996). An important part of the utility calculation is the earnings gain that an individual expects to achieve by switching from one type of employment to the other. As the expected earnings gain associated with self-employment increases, so too does the likelihood of business start-up. Empirical studies in North America and Europe find that expected earnings gains are strongly associated with the likelihood of self-employment for the general population, ethnic minorities, and immigrants (Clark and Drinkwater 2000; Fairlie and Meyer 1996; Hammarstedt 2006; Johansson 2000; and Taylor 1996). However, it has yet to be determined whether immigrants and the domestic-born weigh expected earnings gains the same way. In other words, it is not clear whether the magnitude of the expected earnings gain at which self-employment becomes the preferred option is similar for both groups. Comparisons of immigrants and domestic-born individuals also facilitate the interpretation of analytical results. Working within the utility framework, some analysts interpret a positive association between expected earnings gains and self-employment among immigrants as an indication that low wages make self-employment particularly attractive for this group (Clark and Drinkwater 2000; Hammarstedt 2006). However, such an interpretation is untenable if a similar association is observed among the domestic-born. Overall, the rational-choice approach underscores the relative gains that "pull" individuals into self-employment.

An alternative approach focuses on the factors likely to "push" individuals into self-employment. The disadvantage theory posits that factors such as unemployment, low returns to wage work, language barriers, and discrimination impede immigrants' outcomes in paid employment, motivating some to seek alternative opportunities through business start-up (Light 1979; Model and Lapido 1996; Moore 1983).

Using cross-national data, van Tubergen (2005) found that immigrants' self-employment rates were higher in those countries in which unemployment rates among the domestic-born are high and that an immigrant group's self-employment rate within a country is positively correlated with that group's unemployment rate. However, van Tubergen (2005) did not find that self-employment rates were higher among immigrants in countries where they have more difficulties transferring their human capital to the labour market. Teixeira's (2001) study of Black and Portuguese entrepreneurs in Toronto suggests that Blacks are more likely than Portuguese to report lack of jobs and unemployment as reasons for pursuing self-employment, although family tradition and business orientation are the most important reasons cited by both groups.

Some studies test the disadvantage theory by examining the association between group differences in self-employment rates and socioeconomic status. In the United States, Fairlie and Meyer (1996) showed that self-employment rates are higher among more advantaged ethnic and racial groups, as measured by their earnings characteristics. Other studies assess the disadvantage theory by comparing earnings differences between self-employment and paid work. For example, in Canada, Li (2000) found that recent immigrants who are self-employed earned substantially less than their counterparts in paid employment, after controlling for differences in observable characteristics. Accordingly to Li, this implies that recent immigrants probably encounter obstacles to paid employment and turn to self-employment in response. However, Li did not assess whether the same patterns were evident among non-immigrants. In the United States, Georgarakos and Tatsiramos (2009) provided evidence suggesting that self-employment is more likely to be a transitory stage between unemployment and paid employment for Mexican and other Hispanic immigrants than for non-Hispanic Whites.

In addition to the "push" and "pull" explanations for self-employment discussed above, the role of "ethnic resources" is a theme in the research literature. According to the protective-market hypothesis, ethnic business owners have a competitive advantage serving ethnic markets based on their insider's knowledge of clients' culturally based needs and tastes (Aldrich and Waldinger 1990; Evans 1989; Fairlie and Meyer 1996). Moreover, immigrants may obtain easier financial capital within their own ethic community, as evident among Korean rotating credit associations in the United States (Light *et al.* 1990). The most common measure of ethnic resources is the ethnic enclave, defined as the concentration of co-ethnics in a local area (Sanders and Nee 1987). Borjas (1986), for example, found that self-employment rates among Hispanic immigrants were higher in cities with higher concentrations of Hispanics.

While ethnic enclaves can provide the consumer base and other resources for self-employment, they can also hinder the development of ethnic businesses (Aldrich and Waldinger 1990). Lack of diversity in skills and types of businesses within an ethnic group may increase competition for the same consumer market, making self-employment less attractive (Lieberson 1980). According to Yuengert (1995), the clientele base for ethnic businesses is quite small, even for large groups, and an increase in the group share of co-ethnics in a geographic locale can intensify competition. Indeed, some U.S. and European studies show a negative relationship between the share of one's ethnic group in a geographic area and self-employment rates (Clark and Drinkwater 2000; Kahanec and Mendola 2009; van Tubergen 2005; Yuengert 1995). Razin and Langlois (1996) found that the self-employment rate among immigrant and ethnic groups tends to be lower in Canada's large urban centers than in peripheral metropolitan areas, where co-ethnic competition is likely weaker.

Of these three theoretical approaches, it is perhaps the disadvantage theory that generates the clearest hypotheses regarding differences in the reasons why immigrants and their children become self-employed. Specifically, children of immigrants have credentials obtained from Canadian institutions as well as higher levels of education and better official-language skills than their parents, and hence may have more opportunities for paid employment and a lesser likelihood of being "pushed" into self-employment than their parents. Moreover, children of immigrants are not concentrated in ethnic industries and occupations as was the case for their parents and have labour market outcomes similar to those of the third-and-higher generations (Kasinitz *et al.* 2008; Picot and Hou 2011). Furthermore, even among the self-employed population, a study of second-generation Turkish entrepreneurs in the Netherlands points to shifts away from traditional ethnic niches and entry into emerging sectors, including information technologies, communications, and creative industries (Baycan-Levent *et al.* 2009). Ethnic enclaves and ethnic resources may also play a weaker role in the self-employment decisions of the children of immigrants than was the case with their parents, particularly when second-generation entrepreneurs are able to compete in mainstream markets and consequently do not have to capitalize on opportunities based on ethnic resources and when their ties or attachment to the ethnic group are weaker than those of their parents.

In addition to the three approaches outlined above, self-employment is also correlated with individual and family characteristics. Age and work experience are positively correlated with the likelihood of being self-employed, perhaps because some individuals start businesses later in life after having accumulated the necessary human and financial capital through paid employment (Zissimopoulos and Karoly 2007). As well, older workers may use self-employment as a bridge from paid work to retirement, benefitting from greater control over their work arrangements and retirement decisions (Uppal 2011). For immigrants, however, work experience acquired in the country of origin and work experience acquired in the host country may have different effects. A Dutch study found that the immigrant self-employment is positively correlated with years of work experience in the host country but negatively correlated with years of work experience in the country of origin (Kanas *et al.* 2009).

An extensive review of the empirical research points to no significant correlation between education and entry into self-employment (van der Sluis *et al.* 2008). Education may increase the probability of self-employment by enhancing managerial ability (Sanders and Nee 1996) but may decrease the probability by generating a wider range of employment options (Le 2000).

Language is an important individual characteristic. Proficiency in the host-country language(s) is positively correlated with self-employment, perhaps because it facilitates interaction with business suppliers and customers who are not co-ethnics, and increases understanding of business regulations, legalities, and management practices (Aldrich and Waldinger 1990; Sanders and Nee 1996). Equally, the ability to speak a minority language is an advantage, facilitating contact with co-ethnic employees, customers, and suppliers, and increasing access to ethnic resources (Evans 1989; Min and Bozorgmehr 2000; Waldinger *et al.* 2006).

A German study found that common socio-demographic factors had similar effects on the self-employment of immigrants and non-immigrants, although immigrants who felt they had experienced discrimination in the labour market had a substantially higher probability of self-employment than did others (Constant and Zimmermann 2006).

At the family level, the labour of family members, including spouses and children can play an integral part in family-owned businesses (Boissevain and Grotenberg 1986; Perez 1986). The family contributes to small owner-operated enterprises by putting in unpaid hours of work, sharing fixed costs (rents and mortgages), and providing intra-family loans and household services such as child care (Apitzsch 2005; Boyd 1990; Sanders and Nee 1996). Being married also represents a form of stability, and married couples can pool their finances when starting a business (Borjas 1986; Le 2000).

Finally, how motivations for entering self-employment differ between immigrants and non-immigrants can be assessed by considering the viewpoints of business owners themselves. On the basis of a national survey of self-employed workers, Hou and Wang (2011) found that immigrants (33%), especially recent arrivals (40%), were more likely than the Canadian-born (20%) to report that they had entered self-employment because of lack of suitable paid jobs. However, the majority of immigrants (67%) and the majority of Canadian-born (80%) reported that they had entered self-employment not because of difficulties in the paid labour market. Among self-employed workers who were not "pushed" into self-employment, immigrants were much more likely than the Canadian-born to be motivated for reasons related to entrepreneurship values, including independence, autonomy, being one's own boss, responsibility, decision making, challenge, and creativity. These results suggest that the factors affecting the choice of self-employment are often common for immigrants and non-immigrants, even though the effects of these common factors may vary by immigrant status.

3   Data and methods

3.1   Data

The data used in this study are from the 20% sample of the 1981 Canadian Census of Population and the 20% sample of the 2006 Canadian Census of Population. These datasets are the only Canadian sources that allow self-employment activities to be compared over generations at different points in time (more on this in the next paragraph). Self-employed workers are defined as individuals who identify themselves as mainly self-employed in their own unincorporated or incorporated business.[1] This is a common approach used in Census-based studies (e.g.: Fairlie and Meyer 2003; Portes and Zhou 1996; van Tubergen 2005; Yuengert 1995).[2] Institutional residents, unpaid workers in family businesses, and individuals who reported negative self-employment income are excluded,[3] as are all workers in agricultural industries.

The analysis is restricted to individuals aged 25-to-44 in order to permit generational comparisons of self-employment patterns. It is not possible to directly link parents and their children by means of multi-year Census data. Instead, a generational linkage is made by matching a synthetic cohort of parents with a synthetic cohort of children. This linkage uses two pieces of information: (1) adults' immigration status and the age of their children in 1981; and (2)

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1. In the Census questionnaire, individuals are asked first whether they are: (1) working for wages, salary, tips, or commission; (2) working without pay in a family farm or business; (3) self-employed without paid help; (4) self-employed with paid help. If they are self-employed, individuals are further asked whether their farm or business has been incorporated. In 2006, 41% of all self-employed men and 27% of all self-employed women in non-farming industries reported having their own incorporated business. The definition of self-employment used in this study is similar to that used in Labour Force Survey products, although the self-employment rate estimated from the Census of Population tends to be lower than that estimated from the Labour Force Survey (see Hou *et al.* 2011 for a detailed discussion). Note that while the Census was fielded in 2006 and 1981, Census respondents provide information regarding their income during the year prior to the Census—that is, 2005 and 1980.
2. In the 2006 Census of Population, among the self-employed workers defined according to the class-of-work variable, 55% had the majority of their employment earnings in the year prior to the Census from net self-employment income. The main reason for this is that self-employed workers in incorporated businesses were instructed to report their employment earnings as wages/salaries. Among self-employed workers in unincorporated businesses, 72% had the majority of their employment earnings from net self-employment income.
3. The share of individuals with negative self-employment earnings among all self-employed workers was about 3% in 1981 and 6% in 2006. To check the sensitivity of the study's results to the exclusion of these least successful individuals, all subsequent analyses are replicated without the exclusion, and earnings rather than log earnings are used as the dependent variable in the earnings models. The results support the conclusions drawn from the sample, excluding individuals with negative self-employment income. Tables for the alternate sample are available upon request.

the age of those "children" in 2006 and the immigration status of their "parents." Three groups of adults are selected from the 1981 Census and matched with three groups of adults from the 2006 Census. First, from the 1981 Census, adult immigrants who were aged 25-to-44 and had foreign-born children aged 0 to 18 are selected.[4] These are the parents of immigrant children who landed in Canada before age 19 (referred to below as the *1.5 generation*). These immigrant children were aged 25-to-43 in 2006,[5] and are identified on the basis of their age, their immigration status, and the immigration status of their parents reported at that time. Second, immigrants who were aged 25-to-44 and had Canadian-born children aged 0-to-18 are selected from the 1981 Census. These are the parents of second-generation immigrants (i.e., children born in Canada to immigrant parents). These second-generation immigrants are identified in 2006 on the basis of their age (i.e., 25-to-43), their immigration status (i.e., born in Canada), and the immigration status of their parents. Finally the Canadian-born who were aged 25-to-44 and had Canadian-born children aged 0 to 18 are identified from the 1981 Census. These are the parents of the third-and-higher generations (i.e., children born in Canada to Canadian-born parents). Again, the third-and-higher generations are identified in 2006 on the basis of their age (again, 25-to-43) and the immigration status of their parents. Canadian-born children with one foreign-born and one domestic-born parent are excluded from the study.

By using this approach, it is possible to compare inter-generationally the self-employment activities of parents and of their prospective children when both were aged 25-to-44. This approach is consistent with the method used by Park and Myers (2010) and Smith (2003). Again, the determinants of self-employment are compared over generations, in 1981 and 2006, for three groups: (*i*) immigrant parents and the 1.5 generation; (*ii*) immigrant parents and the second generation; and (*iii*) Canadian-born parents and the third-and-higher generations. Note that men in 2006 are compared with their potential fathers in 1981 and that women in 2006 are compared with their potential mothers in 1981. This gender-specific comparison is necessary because the labour market behaviours and self-employment propensities differ considerably between men and women.

3.2 Methods

In the literature, the choosing of self-employment over paid-employment is generally modeled as a function of socio-demographic characteristics at the individual or family level as well as of "push" and "pull" factors in the labour market (e.g., Constant and Zimmermann 2006). Accordingly, a probit model is constructed respectively for immigrant parents of the 1.5 generation, immigrant parents of the second generation, Canadian-born parents, the 1.5 generation, the second generation, and the third-and-higher generations. These group-specific models allow the included variables to have different effects on self-employment across groups:

$$P_i = \beta'_1 * \left(\ln Y_i^{se} - \ln Y_i^{pe} \right) + \beta'_2 * UNEMP + \beta'_3 * SHARE + \beta'_j X_i + \varepsilon_i$$

X_i are socio-demographic characteristics including educational attainment, years of potential experience, marital status, mother tongue, ethnic group, geographic region, number of children

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4. These adult immigrants could have arrived at any age. The same is also applicable to the potential parents of the second generation.
5. Individuals aged 25-to-44 from the 2006 Census are included in the analysis for the purpose of comparing young adults in the same age range but 25 years apart, although strictly those who were aged 0 to 18 in the 1981 Census should be at the 25-to-43 age range in the 2006 Census.

in the family, and housing tenure.[6] For immigrant parents, the model also includes two additional immigrant-specific variables: potential years of foreign experience and the ability to speak English and/or French.[7]

SHARE is an ethnic group's population share (in proportion) at the regional level: 18 ethnic/population groups and 10 regions are used, yielding 180 unique values in a given year.[8] *UNEMP* is the group-specific regional unemployment rate, where groups are defined by sex, generation/immigration status, education, and region.[9]

Finally, $\ln Y_i^{se}$ and $\ln Y_i^{pe}$ are expected log weekly earnings from self-employment and paid employment, respectively. The difference between them represents the potential earnings differential for individuals if they switched from paid employment to self-employment. This is discussed in detail in Section 4.1.

4   Results

4.1   Expected earnings differentials between paid employment and self-employment

The expected earnings differential between self-employment and paid employment is an important explanatory factor in this analysis, but its estimation is complex. Consequently, this section discusses the estimation methodology used and the extent to which estimated expected earnings differentials changed over the study period. These changes have implications for how one interprets the changing role that expected earnings differentials may have played in the self-employment decisions of different generations.

Potential earnings differentials can be only estimated, since most people work in only one of the two sectors at a given point in time and earnings are observed in only one sector. Therefore, separate earnings equations for the self-employed and for paid workers are estimated in order to predict an individual's earnings in each sector. Since individuals may not be randomly selected into self-employment or paid work, OLS estimators could be biased and inconsistent if unobserved factors affecting earnings were correlated with unobserved factors affecting

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6. Educational attainment includes six categories: no high school certificate; high school certificate or diploma; non-university certificate or diploma; bachelor degree; graduate degree; and degree in medicine, dentistry, veterinary medicine, or optometry. Years of potential experience are estimated as "age minus years of schooling and 6." Mother tongue is coded as follows: English/French = 0; other = 1. Ethnic/population groups are based on the combination of visible-minority status and ethnic ancestry variables (see footnote 8). Marital status is coded as "married" (including common-law) versus "other." Geographic regions are grouped into 13 categories: Montréal, Toronto, Vancouver, and the 10 provinces (which exclude the three largest metropolitan areas in their respective province). Housing tenure is coded as "owner" versus "renter."

7. For immigrants, foreign experience is derived as "age at immigration minus years of schooling and minus 6" when the value is positive or 0. The Canadian work experience of immigrants is simply the difference between their total potential years of experience and their estimated foreign experience. For the Canadian-born, all their potential years of experience are assumed to have been acquired in Canada.

8. Ethnic/population groups are based on the combination of visible-minority status and ethnic ancestry variables. Visible-minority status is used to identify sub-groups within the visible-minority population, while ethnic ancestry is used to classify ethnic groups within the non-visible-minority population. The 18 ethnic/population groups identified are the following: Chinese, South Asian, Black, Filipino, Korean/Japanese, Arab/Western Asian, Latin American, Other visible minorities, British, French, German, Italian, Ukrainian, Dutch, Polish, Jewish, Portuguese, Other European origins. The 10 regions are Toronto census metropolitan area (CMA), rest of Ontario, Montreal CMA, rest of Quebec, Vancouver CMA, rest of British Columbia and territories, Alberta, Manitoba, Saskatchewan, and Atlantic region.

9. For each sex and group (i.e., parents of the 1.5 generation, parents of the second generation, Canadian-born parents, the 1.5 generation, the second generation, and the third-and-higher generations), unemployment rates are estimated by education (four levels: less than high school; high school graduate; some post-secondary; university degree) and region (10 groups, as defined in the footnote 8, above).

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employment choices. To deal with this problem, the endogenous switching framework is often applied in the literature (Constant and Zimmermann 2006; Hamilton 2000; Lofstrom 2002; Yuengert 1995). Predicted self-employment earnings for both the self-employed and paid workers are based on the model of earnings among the self-employed; a correction for the possibility that the self-employed may have different characteristics than paid employees is included. Similarly, predicted paid-employment earnings for both the self-employed and paid workers are based on the model of earnings among paid employees; a correction for the possibility that they may differ from self-employed individuals is included. This involves the estimate of the following equations.

Reduced-form probit model of self-employment:

$$S_i^* = \gamma X_i + \mu_i$$

$$S_i = 1 \text{ if } S_i^* > 0$$

$$S_i = 0 \text{ if } S_i^* \leq 0$$

Earnings models:

Self-employed: $\quad \ln Y_i^{se} = \alpha_1 . Z_{1i} + \varepsilon_{1i} \quad$ if $S_i = 1$;

Paid workers: $\quad \ln Y_i^{pe} = \alpha_2 . Z_{2i} + \varepsilon_{2i} \quad$ if $S_i = 0$;

Here, S_i^* is the probability that an individual with X_i characteristics would choose self-employment over paid work. $\ln Y_i^{se}$ is log weekly earnings among the self-employed, and $\ln Y_i^{pe}$ is log weekly earnings among paid workers. The covariance of μ_i and ε_{1i} and between μ_i and ε_{2i} can be estimated by using the maximum-likelihood method. The covariance of ε_{1i} and ε_{2i} is not estimated, since Y_{1i} and Y_{2i} are assumed to not be presented simultaneously.[10]

For both the self-employed and paid workers, earnings are the sum of net self-employment income and wages/salaries.[11] It is well-known that any analysis of self-employment income should be interpreted with caution. On the one hand, a higher tendency to under-report income among the self-employed would bias upwards any income disadvantages to self-employment relative to paid employment.[12] On the other hand, employee non-wage benefits (e.g., pension contributions and medical benefits) that are unavailable to the self-employed would exaggerate any relative income advantages to self-employment (Parker 2004). With Census data, it is not possible to deal with these potential biases. For simplicity, it is assumed that these potential biases are constant over time and across generational groups.

In the reduced-form probit model of self-employment, X_i includes educational levels, potential experience, visible-minority status, marital status, geographic region, mother tongue, housing ownership, and number of children in the family. In the earnings model, Z_i includes educational

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10. It is possible that some individuals could work on multiple jobs and be self-employed and paid workers at the same time. However, in this paper, the self-employed and paid workers are defined exclusively on the basis of the individual's main job.

11. In the Census, the self-employed in incorporated businesses are instructed to report their employment income as wages/salaries.

12. On the basis of household expenditure patterns, Schuetze (2002) estimated that the self-employed in Canada on average under-reported their income by 11% to 23% but noted that the degree of under-reporting did not increase from the 1970s to 1990s. Dunbar and Fu (2008) showed that income under-reporting is not confined to the self-employed, although the self-employed have a higher tendency to under-report their income.

attainment, potential experience, visible-minority status, marital status, mother tongue, full-time/part-time work hours, and geographic region. Following the practice of previous studies, the number of children in the family is used as an exclusion restriction (i.e., it is included in the probit model but not in the earnings models) (Johansson 2000; Simpson and Sproule 1998; Taylor 1996).[13] This variable is a significant predictor of self-employment in this study. To examine the sensitivity of the results to the choice of the exclusion restriction, the number of adults in the household is used as either the alternative exclusion restriction or the additional exclusion restriction, but it is a significant predictor of self-employment only in the models based on 2006 data. Homeownership is another variable that is included in the probit model but not in the earnings model. An owned house may facilitate self-employment because it can be used for operating a business and/or as collateral when applying for business loans. However, it is questionable whether homeownership is a valid instrument since it may be endogenous to earnings. Nevertheless, the results regarding the effect of expected earnings differentials are not affected by the inclusion of homeownership or the number of adults in the household.

Table 1 presents changes in earnings from self-employment and paid employment, as well as the estimated expected earnings differential between self-employment and paid workers by immigrant and generational status. Over the 25-year reference period, the relative difference in the observed earnings of the self-employed and of paid employees changed considerably for men and changed to a lesser extent for women. Between 1981 and 2006, the mean weekly earnings of self-employed sons were 8% to 22% lower than those of self-employed fathers, according to the immigration status of the fathers (Table 1). The decline of median weekly earnings was even larger, in the range of 23% to 31%. In comparison, the earnings declines were smaller among paid workers. For example, the median weekly earnings of sons in paid employment (in 2006) were 5% to 13% lower than those of fathers in paid employment (in 1981). Declining earnings among young men in paid employment has been well-documented in the literature (e.g., Beaudry and Green 2000). Numerous explanations have been put forward, including skill-biased technological changes, the growth of international trade, increases in international outsourcing, and institutional changes such as de-unionization and movements in the real minimum wage (see review by Katz and Autor 1999). The much larger decline in self-employment earnings, however, is less well documented and may reflect the changing nature of self-employment among young men, such as the increasing share who do not employ paid workers and the extent to which they work in unstable and low-paying jobs (Arum and Mueller 2004; Baldwin and Chowhan 2003; Kuhn and Schuetze 2001).[14]

The larger decline in earnings among self-employed workers than among paid employees led to a change in the relative earnings positions of these groups. Among fathers in 1980, the self-employed had higher mean weekly earnings than did paid employees, a fact that was driven by the large share of self-employed workers at the top of the earnings distribution. As shown in charts 1, 3, and 5, in 1980, self-employed men were over-represented both at the bottom and at the top of the earnings distribution, and their over-representation at the top drove up their mean earnings. In terms of median weekly earnings, the self-employed earned 8% to 11% less than paid workers. These differences in median weekly earnings were close to the corresponding

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13. The inclusion of at least one extra variable (exclusion restriction) in the selection equation is generally required in order to generate credible estimates. Without such a restriction, it is possible that the maximum-likelihood estimator would not be robust (Puhani 2000).

14. A preliminary analysis shows that changes in industrial structure among the self-employed are unlikely to be a major contributor to the large decline in earnings. For instance, among Canadian-born self-employed men, the industrial structure became less concentrated and there was a large shift from primary industries to service industries, particularly business services. Such a shift would have increased, rather than reduced, the average self-employment earnings if self-employment earnings within specific industrial sectors had remained the same. Over the 25-year study period, average self-employment earnings fell in several major sectors, including business services, transportation and communications, primary industries, and construction.

differences in mean log weekly earnings between the self-employed and paid workers.[15] Therefore, log weekly earnings were used to model expected earnings differentials.[16]

Table 1
Earnings by self-employment status and difference in expected earnings

	Immigrant parents and 1.5 generation		Immigrant parents and second generation		Canadian-born parents and third-and-higher generations	
	Parents	Children	Parents	Children	Parents	Children
Fathers and sons						
Mean weekly earnings in 2005 dollars						
Self-employed	1,270	1,102	1,263	1,168	1,315	1,030
Paid workers	1,111	1,090	1,118	1,165	1,144	1,070
Median weekly earnings in 2005 dollars						
Self-employed	912	629	903	693	935	654
Paid workers	993	876	1,013	961	1,028	893
Mean log weekly earnings						
Self-employed	6.78	6.39	6.78	6.46	6.83	6.39
Paid workers	6.84	6.69	6.86	6.78	6.91	6.74
Diffference in expected earnings between self-employment and paid employment, in log points	-0.17	-0.43	-0.16	-0.43	-0.17	-0.42
Mothers and daughters						
Mean weekly earnings in 2005 dollars						
Self-employed	682	895	707	882	630	668
Paid workers	567	837	601	897	605	760
Median weekly earnings in 2005 dollars						
Self-employed	433	481	468	495	389	353
Paid workers	486	698	501	750	501	632
Mean log weekly earnings						
Self-employed	5.93	6.08	6.02	6.08	5.84	5.80
Paid workers	6.08	6.43	6.13	6.50	6.10	6.35
Difference in expected earnings between self-employment and paid employment, in log points	-0.19	-0.42	-0.12	-0.42	-0.30	-0.56

Sources: Statistics Canada, 1981 Canadian Census of Population and 2006 Canadian Census of Population.

In 2005, sons in self-employment were not over-represented at the top of the earnings distribution (as fathers had been 25 years earlier). Instead, their over-representation at the bottom of the distribution had increased (relative to fathers 25 years earlier) (charts 2, 4, and 6).

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15. The difference in log points (when multiplied by 100) is often interpreted as approximating the percentage difference in actual earnings. The extent to which the difference in log earnings approximates the percentage difference in actual earnings depends on the size of the difference. Large log earnings differences (especially those of absolute value larger than 0.10) often overestimate the percentage difference.
16. Logarithmic transformation often smoothes the earnings distribution since it reduces the influence of very high earnings and increases the influence of very low earnings, compared to untransformed earnings. Previous studies have suggested that, by using logarithmic transformation of earnings versus earnings, one would reach different conclusions regarding the benefit of self-employment relative to that of paid employment (Borjas 1990; Portes and Zhou 1996). The log form often fits the data better and reduces the effect of outliers on the estimates. However, the log transformation tends to obscure the possibility that self-employment may produce a larger number of high earners than does paid employment (Portes and Zhou 1996). The present study tested whether using weekly earnings rather than log weekly earnings to estimate expected-earnings differentials would affect the conclusion. The results were not sensitive to the choice of the functional forms of earnings. This is because it is the variation among individuals in the expected-earnings differentials, not the mean expected-earnings differentials, which matters in the model estimates. The functional forms of earnings have a large effect on the estimated mean expected-earnings differentials between self-employment and paid employment but have little effect on the variation among individuals in the expected-earnings differentials.

In terms of median weekly earnings, the self-employed earned 37% to 39% less than paid workers in 2005, according to generational status. The corresponding differences in log weekly earnings were 0.30 to 0.35.

In contrast to the generational declines in earnings experienced by young men, daughters had higher mean weekly earnings than did their mothers in both self-employment and the paid labour market (Table 1). This is consistent with the general trend of continuing increases in women's labour force participation and earnings over the recent decades (Goldin 2006; Kuhn and Schuetze 2001).

Median weekly earnings from self-employment also increased from immigrant mothers to the 1.5-generation daughters and to the second-generation daughters, but decreased from Canadian-born mothers to the third-and-higher-generation daughters. Charts 7, 9, and 11 show that, among mothers in 1980, the self-employed and paid workers had similar earnings distributions, although the former had higher shares at both tails of the distribution. However, self-employed daughters in 2005 were much more concentrated at the bottom of the earnings distribution than were paid-employed daughters in 2005 and were no longer over-represented in the top of the earnings distribution; this is especially true of third-and-higher-generation daughters (Charts 8, 10, and 12).

Chart 1

Weekly earnings distribution of male workers by self-employment status — Fathers of the 1.5 generation, 1980
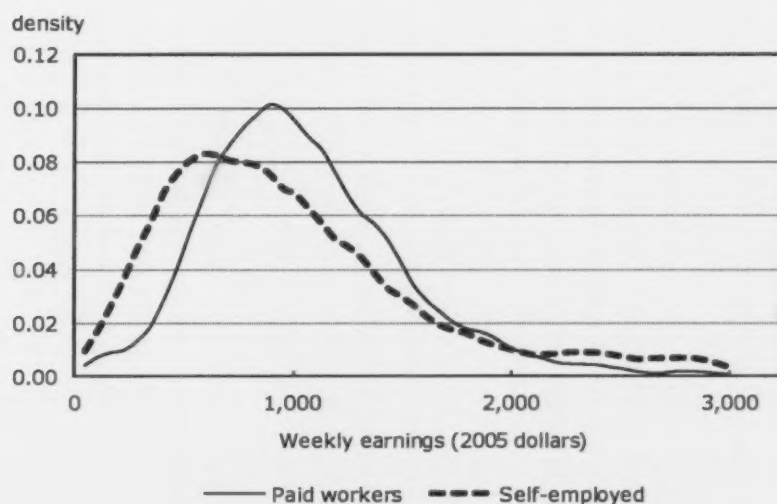
density

Weekly earnings (2005 dollars)

——— Paid workers   ▪▪▪ Self-employed

Sources: Statistics Canada, 1981 Canadian Census of Population and 2006 Canadian Census of Population.

Chart 2

Weekly earnings distribution of male workers by self-employment status — 1.5-generation men, 2005
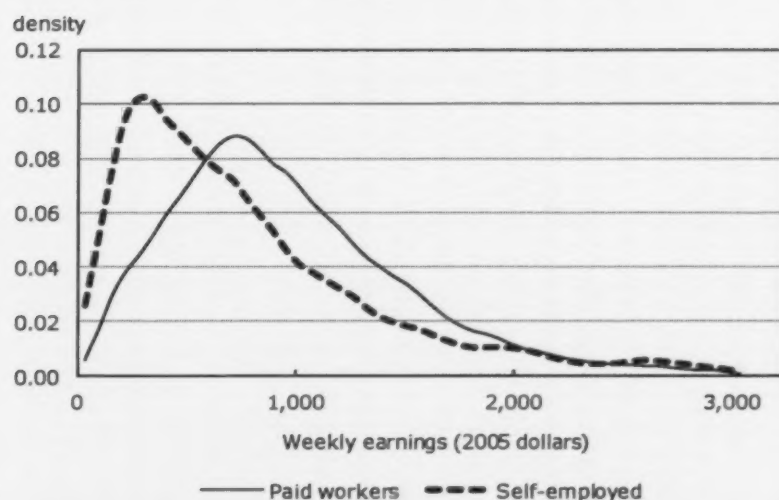
density

Weekly earnings (2005 dollars)

——— Paid workers   ▬▬▬ Self-employed

Sources: Statistics Canada, 1981 Canadian Census of Population and 2006 Canadian Census of Population.

Chart 3

Weekly earnings distribution of male workers by self-employment status — Fathers of the second generation, 1980

density

Weekly earnings (2005 dollars)

——— Paid workers   ▬▬▬ Self-employed

Sources: Statistics Canada, 1981 Canadian Census of Population and 2006 Canadian Census of Population.

Chart 4

Weekly earnings distribution of male workers by self-employment status — Second-generation men, 2005

density

Weekly earnings (2005 dollars)

——— Paid workers ▬▬▬ Self-employed

Sources: Statistics Canada, 1981 Canadian Census of Population and 2006 Canadian
Census of Population.

Chart 5

Weekly earnings distribution of male workers by self-employment status — Fathers of the third-and-higher generations, 1980

density

Weekly earnings (2005 dollars)

——— Paid workers ▬▬▬ Self-employed

Sources: Statistics Canada, 1981 Canadian Census of Population and 2006 Canadian
Census of Population.

Chart 6

Weekly earnings distribution of male workers by self-employment status — Third-and-higher-generation men, 2005

density

Weekly earnings (2005 dollars)

——— Paid workers ▬▬▬ Self-employed

Sources: Statistics Canada, 1981 Canadian Census of Population and 2006 Canadian Census of Population.

Chart 7

Weekly earnings distribution of female workers by self-employment status — Mothers of the 1.5 generation, 1980

density

Weekly earnings (2005 dollars)

——— Paid workers ▬▬▬ Self-employed

Sources: Statistics Canada, 1981 Canadian Census of Population and 2006 Canadian Census of Population.

Chart 8

Weekly earnings distribution of female workers by self-employment status — 1.5-generation women, 2005

density

Weekly earnings (2005 dollars)

——— Paid workers ▬ ▬ ▬ Self-employed

Chart 9

Weekly earnings distribution of female workers by self-employment status — Mothers of the second generation, 1980

density

Weekly earnings (2005 dollars)

——— Paid workers ▬ ▬ ▬ Self-employed

Chart 10

Weekly earnings distribution of female workers by self-employment status — Second-generation women, 2005

density

Weekly earnings (2005 dollars)

——— Paid workers   ▬ ▬ ▬ Self-employed

Sources: Statistics Canada, 1981 Canadian Census of Population and 2006 Canadian Census of Population.

Chart 11

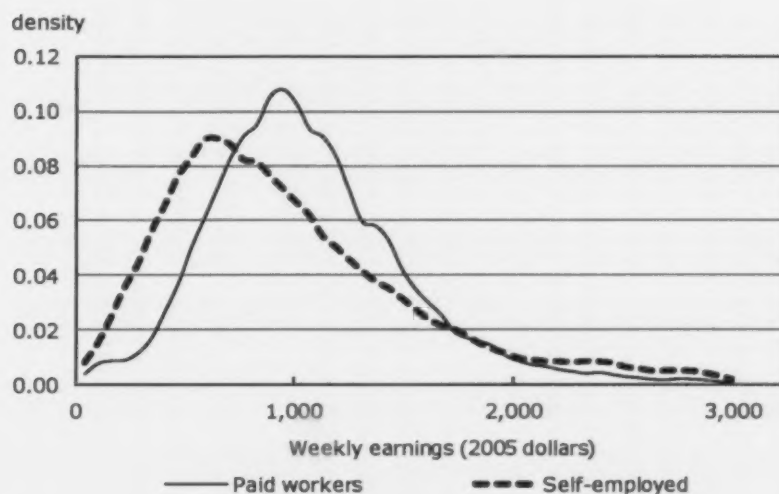**Weekly earnings distribution of female workers by self-employment status — Mothers of the third-and-higher generations, 1980**

density

Weekly earnings (2005 dollars)

——— Paid workers   ▬ ▬ ▬ Self-employed

Sources: Statistics Canada, 1981 Canadian Census of Population and 2006 Canadian Census of Population.

Chart 12

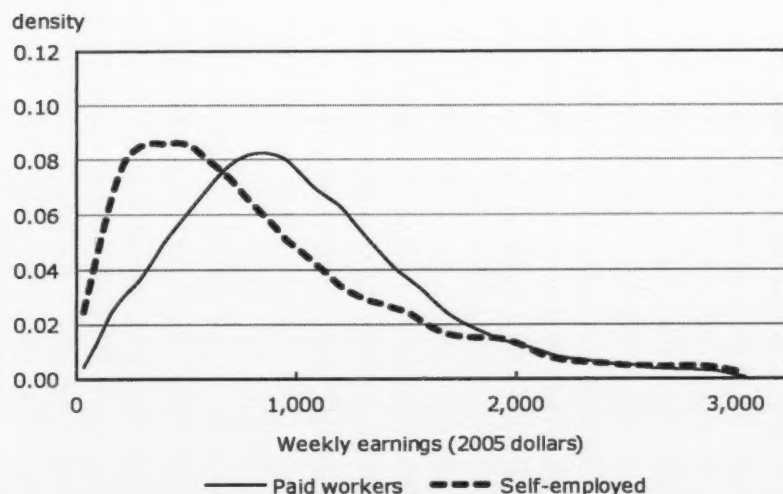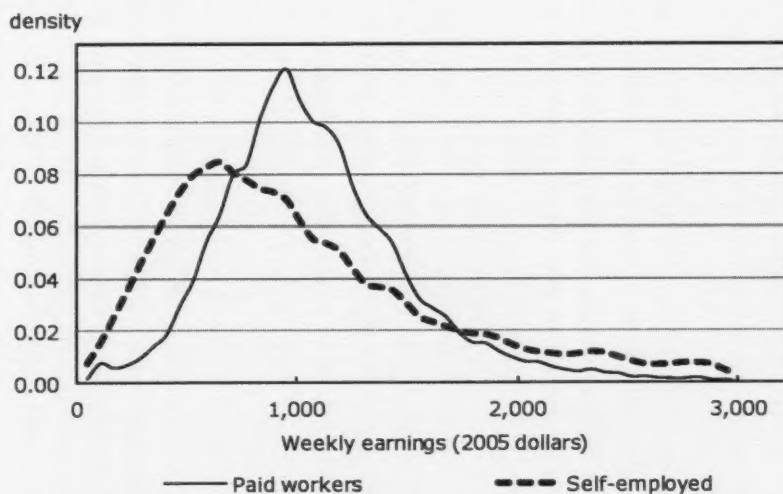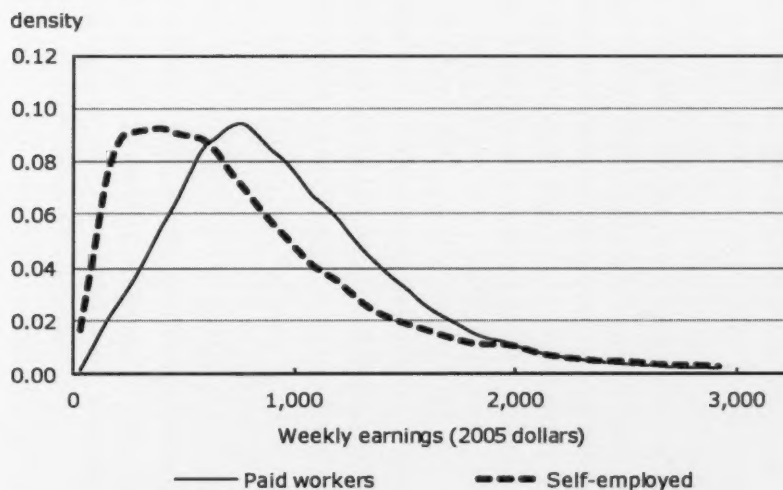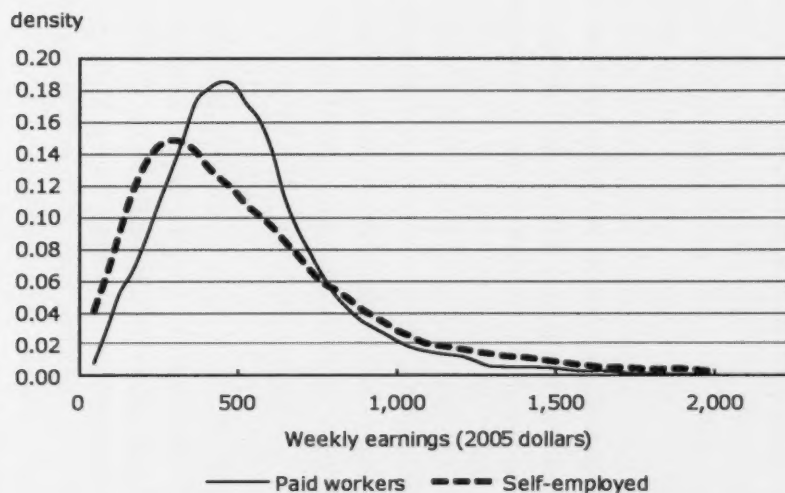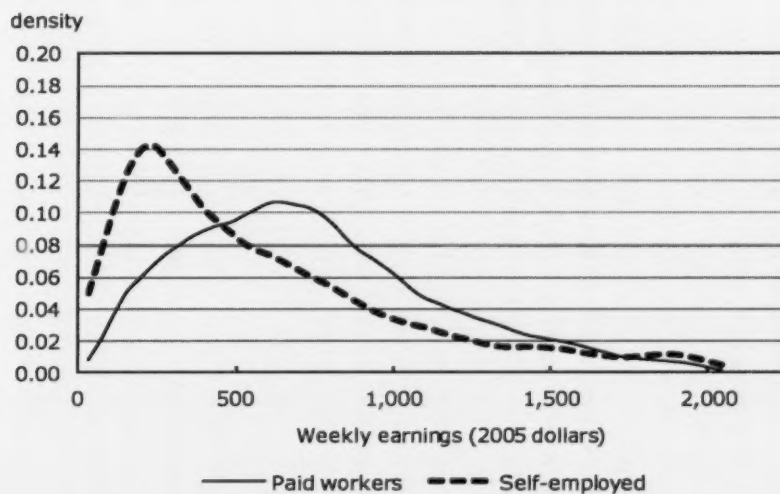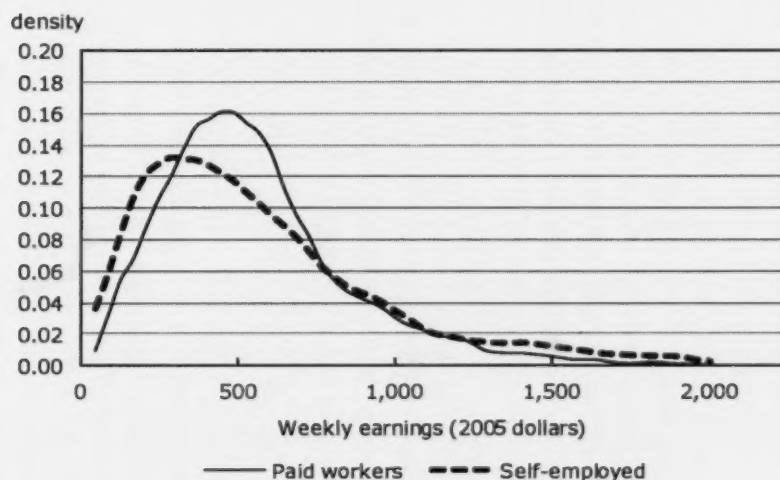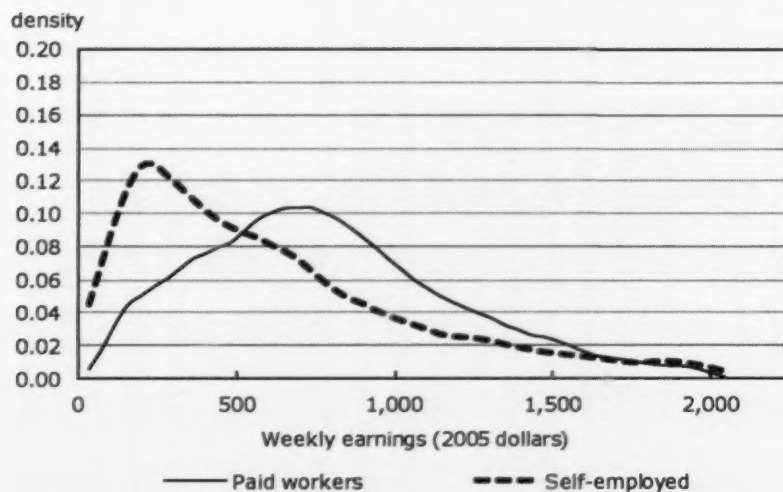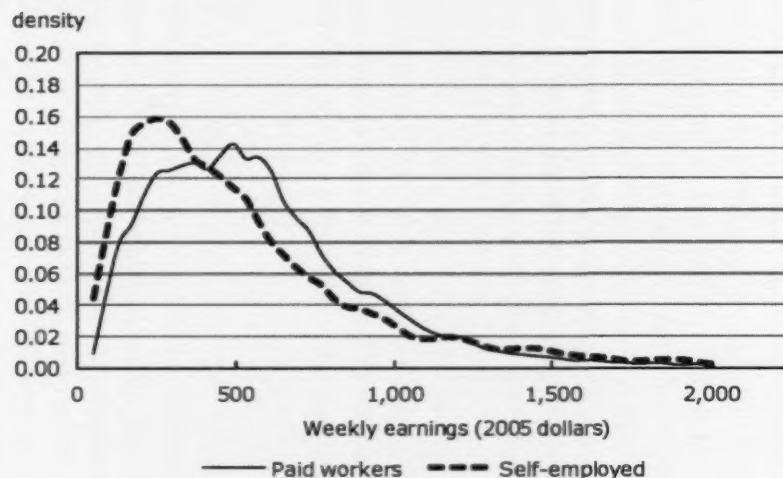**Weekly earnings distribution of female workers by self-employment status — Third-and-higher-generation women, 2005**

density

Weekly earnings (2005 dollars)
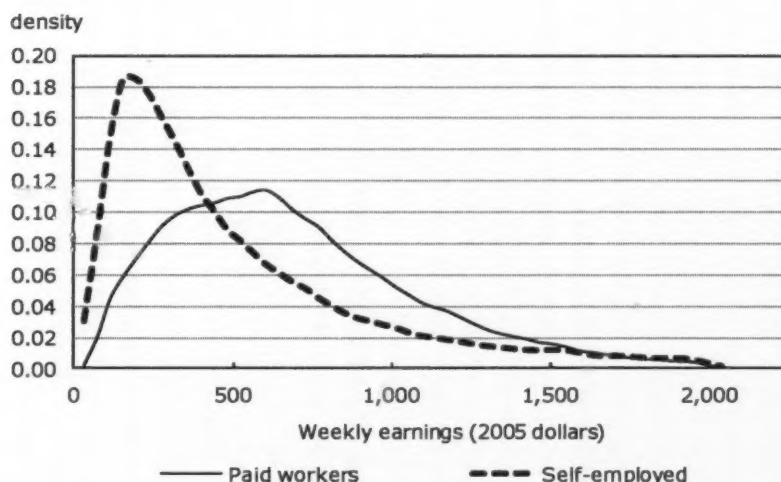
———— Paid workers   ▬ ▬ ▬ Self-employed

As was the case among men, earnings from mothers to daughters rose much more among paid workers than among the self-employed. As a result, the gap in median weekly earnings or log weekly earnings between the self-employed and paid workers increased substantially from mothers in 1980 to daughters in 2005 (Table 1). While the log weekly earnings of self-employed mothers were 0.11-points to 0.26-points lower than those of their counterparts in paid employment according to immigration status, the corresponding gaps were 0.35 to 0.55 points among daughters.

The widening gap signals a large deterioration in the relative earnings position of most self-employed men and women. This deterioration was clearly reflected in the expected earnings differentials.[17] For example, from Canadian-born fathers to third-and-higher-generation men, the expected earnings differentials changed from -0.17 log points to -0.42 (Table 1). The magnitude of the change was similar from immigrant parents to their children. The negative expected earnings differential may suggest that, on average, workers would receive lower earnings if they switched from paid employment to self-employment. To some extent, this may also capture the possibility that the self-employed tend to under-report their earnings (Schuetze 2002). What is significant is the substantial widening of the expected earnings differential from 1980 to 2005, given that the tendency to under-report earnings did not intensify (Schuetze 2002; Dunbar and Fu 2008).[18] Of course, while the average expected earnings differential is negative, a certain share of individuals would expect higher earnings in self-employment than in paid employment.

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17. The expected-earnings differentials are estimated from the earnings functions on the basis of Heckman selection models for paid workers and the self-employed. Table 5 presents the earnings models for fathers in 1980, while Table 6 presents the earnings models for sons in 2005. Table 7 and Table 8 present the corresponding earnings models for women. Changes in these earnings functions are discussed in the appendix.

18. However, in examining changes in the pattern of income under-reporting among married households with self-employment income from 1982–1986 to 1992–1996, Tedds (2010) suggested that the implementation of the Goods and Services Tax (GST) in Canada in 1991 increased tax noncompliance by those with larger amounts of self-employment income but did not affect the tax compliance of those with small amounts of self-employment income.

However, this share decreased over time as well. For instance, about 17% of Canadian-born fathers in 1980 had positive expected earnings differentials. Among their sons in 2005, this share was only 2%.

In sum, the results in this section indicate that, over the 25-year reference period, the relative earnings position of young self-employed workers declined considerably relative to that of young paid employees, particularly among men. Correspondingly, there was a large decrease in the expected earnings differential when workers switched from paid work to self-employment. A likely implication is that the increased difficulties in making gainful earnings in self-employment may heighten the economic utility calculation in young adults' self-employment decision.

4.2   Correlates of self-employment

With respect to the three theoretical approaches outlined in Section 2, the relative importance of expected earnings differentials, difficulties in the labour market, and ethnic enclaves to self-employment among different groups will now be assessed. The importance of additional socio-demographic characteristics is considered as well. For this purpose, probit models are run separately for parents and children; results are presented in Table 2.

Table 2
Probit regressions on the likelihood of self-employment for parents and their children

	Immigrant parents and 1.5 generation		Immigrant parents and second generation		Canadian-born parents and third-and-higher generations	
	Parents	Children	Parents	Children	Parents	Children
			coefficient			
Variables						
Fathers and sons						
Earnings differential	1.009 ***	1.056 ***	0.817 ***	1.127 ***	2.454 ***	1.700 ***
Group unemployment rate	3.359	-0.163	3.739 **	-0.047	1.516 ***	-0.638 *
Group population share	0.363	-0.111	-0.050	-0.087	0.403 ***	0.051 **
Number of children present	0.021	-0.002	0.025 **	-0.010	-0.049 ***	-0.030 ***
Homeowners	-0.070	-0.043	-0.027	-0.076 **	-0.333 ***	-0.190 ***
No diploma/certificate	-0.193 ***	0.101 ***	-0.161 ***	0.079	-0.361 ***	-0.073 ***
Non-university diploma	0.048	0.177 ***	0.047	0.115 ***	0.261 ***	0.165 ***
Bachelor degree	0.052	0.068	-0.001	0.015	-0.125 ***	-0.111 ***
Degree in medicine	1.184 ***	0.918 ***	1.184 ***	0.795 ***	1.469 ***	0.897 ***
Graduate degree	-0.176 *	0.067	-0.270 ***	-0.107 **	-0.435 ***	-0.249 ***
Years of Canadian experience	0.062 ***	0.089 ***	0.045 ***	0.073 ***	0.071 ***	0.094 ***
Canadian experience squared	-0.002 ***	-0.002 ***	-0.001 ***	-0.002 ***	-0.001 ***	-0.002 ***
Married	0.072	0.250 ***	0.250 **	0.227 ***	0.184 ***	0.395 ***
English/French mother tongue	-0.145 ***	-0.151 ***	-0.097 ***	-0.090 ***	-0.011	-0.341 ***
Years of foreign experience	0.008 ***	...	0.006 **	...	...	...
Speaks neither English nor French	-0.379 ***	...	-0.407 ***	...	...	...
Mothers and daughters						
Earnings differential	0.371	2.211 ***	0.267	2.185 ***	0.180 ***	1.437 ***
Group unemployment rate	-0.407	-0.424	0.726	-0.880	1.428 ***	-0.419
Group population share	-0.052 ***	-0.336 ***	0.024	-0.127	0.314 ***	0.021
Number of children present	0.027	0.037 ***	0.086 ***	-0.004	0.051 ***	0.050 ***
Homeowners	0.119	0.101 ***	0.110 ***	0.049 *	0.183 ***	0.148 ***
No diploma/certificate	-0.119 *	0.264 ***	-0.117 **	0.020	-0.090 ***	-0.180 ***
Non-university diploma	0.096 *	0.568 ***	0.093 *	0.316 ***	0.105 ***	0.319 ***
Bachelor degree	0.015	0.491 ***	0.117	0.052	0.162 ***	0.024
Degree in medicine	0.680 **	0.121	1.161 ***	-0.484 ***	1.596 ***	0.255 ***
Graduate degree	0.066	0.153 ***	0.152	-0.052	0.200 ***	-0.173 ***
Years of Canadian experience	0.011	0.157 ***	0.030 **	0.099 ***	0.025 ***	0.109 ***
Canadian experience squared	0.000	-0.004 ***	-0.0007	-0.003 ***	-0.0004 ***	-0.003 ***
Married	0.167 *	0.124 ***	0.114 *	0.277 ***	0.201 ***	0.273 ***
English/French mother tongue	0.043	0.112 ***	0.005	0.098 ***	-0.004	0.099 *
Years of foreign experience	0.000	...	-0.001	...	...	...
Speaks neither English nor French	-0.276 **	...	-0.210 **	...	...	...
Diagnostic statistics						
Fathers and sons						
Number of observations	20,523	48,761	48,359	66,863	311,766	408,034
Pseudo R-squared	0.097	0.061	0.087	0.049	0.053	0.043
Mothers and daughters						
Number of observations	20,609	44,990	35,087	62,814	228,453	395,639
Pseudo R-squared	0.081	0.081	0.078	0.069	0.027	0.048

See note and sources at end of table.

Table 2

Probit regressions on the likelihood of self-employment for parents and their children (concluded)

	Immigrant parents and 1.5 generation	Immigrant parents and second generation	Canadian-born parents and third-and-higher generations
Control variables			
Fathers and sons			
Ethnic group fixed effects	Included	Included	Included
Geographic location effects	Included	Included	Included
Mothers and daughters			
Ethnic group fixed effects	Included	Included	Included
Geographic location effects	Included	Included	Included

* p<0.05
** p<0.01
*** p<0.001
Note: "Renter" is the reference for the homeownership variable; "high school graduate certificate" is the reference for education; "not married" is the reference for marital status; and "neither English nor French" is the reference for mother tongue.
Sources: Statistics Canada, 1981 Canadian Census of Population and 2006 Canadian Census of Population.

The results show a clear increase over generations in the effect of expected earnings differentials on the likelihood of self-employment. For men, expected earning differentials were positively and significantly correlated with the likelihood of self-employment among fathers and sons in all three groups. Note that it is not appropriate to directly compare the magnitude of the coefficients of each variable across these models because their marginal effects are affected by both the values and the coefficients of other variables. To gauge the relative effect of expected earnings differentials for different population groups, the marginal effect of the expected earnings differentials was estimated by holding variable values at the means for the third-and-higher generations while the coefficients of each model remain unchanged. The results are presented in Table 3. The marginal effect of expected earnings differentials was larger for sons than for fathers within all three groups. Among immigrant fathers and second-generation sons, for example, a 10-percentage-point increase in the expected earnings differential was associated with a 1.6-percentage-point increase in the self-employment rate of fathers (in 1981) and with a 2.5-percentage-point increase in the rate among sons (in 2006). Across groups, the marginal effect of the expected earnings differential was larger among Canadian-born fathers and their third-and-higher-generation sons than among immigrant fathers and their sons.

Group-specific unemployment rates, an indicator of difficulties experienced by a particular group in the local labour market, was positively correlated with self-employment among fathers in 1981—although, for fathers of the 1.5 generation, this effect is less statistically significant (at $p = 0.06$). However, the estimated marginal effect of unemployment rates was much larger for immigrant fathers than for Canadian-born fathers (Table 3). For example, a 10-percentage-point increase in the unemployment rate was associated with a 4-percentage-point to 7-percentage-point increase in the self-employment rate of immigrants fathers (in 1981), compared with a 1.5-percentage-point increase among Canadian-born fathers. In contrast, unemployment rates had little effect on the self-employment rates of 1.5-generation sons or second-generation sons and had a negative effect on the self-employment rates of third-and-higher-generation sons. Clearly, unemployment rates were most strongly correlated with self-employment among first-generation male immigrants. Among women, unemployment rates were not strongly correlated with self-employment, although they were statistically significant for Canadian-born mothers in 1981.

Table 3

Estimated marginal effects of expected earnings differentials and group-specific local unemployment rates on self-employment rates

	Immigrant parents and 1.5 generation	Immigrant parents and second generation	Canadian-born parents and third-and-higher generations
	percentage-point change[1]		
Fathers in 1981	1.49	1.56	2.36
Sons in 2006	2.06	2.45	3.57
Mothers in 1981	0.32	0.32	0.12
Daughters in 2006	3.78	2.67	2.64
	percentage-point change[2]		
Fathers in 1981	4.18	6.58	1.45
Sons in 2006	-0.03	-0.01	-1.34
Mothers in 1981	-0.34	0.77	1.01
Daughters in 2006	-0.70	-1.00	-0.77

1. The percentage-point change is associated with a 10-percentage-point increase in expected earnings differentials.
2. The percentage-point change is associated with a 10-percentage-point increase in unemployment rates.
Source: Estimated from models in Table 2 and holding variables at the means of third-and-higher generations.

Group population share, which is intended to measure the effect of ethnic enclaves, is not significant for immigrant fathers or their sons (Table 2). In contrast, and perhaps surprisingly, it is positive and significant for Canadian-born fathers and for the third-and-higher-generation sons. Since these models include people who report British, French, and Canadian ethnic origins, and since these groups dominate the sample of Canadian-born parents and the sample of third-and-higher generations, the results may not reflect the relationship in minority ethnic groups. Table 4 replicates the models in Table 2 but excludes people reporting British, French, or Canadian ethnic origins. The coefficient of group population share was negative and significant for second-generation sons, and this coefficient was also negative but not statistically significant for their immigrant fathers. The coefficient remained positive and significant for Canadian-born fathers, and positive, but not significant, for third-and-higher-generation sons.

It bears noting that Canadian-born ethnic minorities in 1981 were predominantly of European origin (at over 97%) while about one-half of immigrant ethnic minorities in 1981 had non-European origins. Among women, the effect of ethnic enclaves was negative and significant for 1.5-generation daughters and their mothers and was not significant for female members of the second generation and their immigrant mothers; the effect of ethnic enclaves was positive and significant for Canadian-born mothers but not for their third-and-higher-generation daughters. These results suggest that the effect of ethnic enclaves on the likelihood of self-employment may differ by ethnic group and gender.

Table 4

Probit regressions on the likelihood of self-employment for parents and children, excluding British/French/Canadian groups

Variables	Immigrant parents and 1.5 generation		Immigrant parents and second generation		Canadian-born parents and third-and-higher generations	
	Parents	Children	Parents	Children	Parents	Children
			coefficient			
Fathers and sons						
Earnings differential	0.811 ***	0.902 ***	0.644 ***	1.120 ***	2.010 ***	1.409 ***
Group unemployment rate	3.567	0.322	2.678 *	-0.316	1.153	-0.049
Group population share	-0.963	-0.238	-0.634	-0.829 *	0.752 **	0.614
Number of children present	0.025	0.002	0.039 **	-0.010	-0.030 *	-0.012
Homeowners	-0.008	-0.013	0.004	-0.065 *	-0.175 ***	-0.123 ***
No diploma/certificate	-0.158 **	0.055	-0.161 ***	0.108	-0.236 ***	0.027
Non-university diploma	0.098	0.143 ***	0.028	0.128 ***	0.219 ***	0.184 ***
Bachelor degree	0.029	0.042	-0.082	0.007	-0.201 ***	0.033
Degree in medicine	1.002 ***	0.942 ***	0.997 ***	0.792 ***	0.876 ***	0.962 ***
Graduate degree	-0.172 *	0.097	-0.322 ***	-0.058	-0.542 ***	-0.123 *
Years of Canadian experience	0.072 ***	0.083 ***	0.054 ***	0.070 ***	0.051 ***	0.086 ***
Canadian experience squared	-0.002 **	-0.002 ***	-0.001 ***	-0.001 ***	-0.001 ***	-0.002 ***
Married	0.036	0.242 ***	0.187 *	0.231 ***	0.179 **	0.380 ***
English/French mother tongue	-0.167 ***	-0.116 ***	-0.103 **	-0.100 ***	-0.054 *	-0.427 ***
Years of foreign experience	0.008 *	...	0.006 **	...	...	...
Speaks neither English nor French	-0.357 ***	...	-0.395 ***	...	...	...
Mothers and daughters						
Earnings differential	0.186	1.844 ***	-0.032	2.088 ***	0.055	1.059 ***
Group unemployment rate	0.238	-0.376	-0.549	-0.940	-0.396	-1.104
Group population share	-1.406	-1.310 **	-1.809 **	-0.761	-0.114	-0.493
Number of children present	0.026	0.028 *	0.105 ***	-0.0008	0.064 ***	0.048 ***
Homeowners	0.154	0.105 **	0.081 *	0.010	0.193 ***	0.117 ***
No diploma/certificate	-0.112 *	0.411 ***	-0.104 **	0.031	-0.021	-0.049
Non-university diploma	0.086	0.484 ***	0.033	0.237 ***	0.070 *	0.158 ***
Bachelor degree	-0.097	0.475 ***	-0.057	0.086 *	0.056	0.034
Degree in medicine	0.662 **	0.399 **	1.308 ***	-0.323 *	1.472 ***	0.656 ***
Graduate degree	-0.064	0.336 ***	0.012	-0.073	0.051	0.015
Years of Canadian experience	0.032 *	0.156 ***	0.035 **	0.093 ***	0.021 *	0.096 ***
Canadian experience squared	-0.001	-0.004 ***	-0.0006	-0.003 ***	-0.0005	-0.003 ***
Married	0.179 *	0.074 **	0.054	0.328 ***	0.173 ***	0.137 ***
English/French mother tongue	0.093	0.076 *	-0.011	0.089 ***	0.010	0.191 **
Years of foreign experience	0.003	...	-0.0001	...	...	...
Speaks neither English nor French	-0.274 ***	...	-0.204 ***	...	...	...
Diagnostic statistics						
Fathers and sons						
Number of observations	14,528	39,685	37,129	54,391	47,672	49,536
Pseudo R-squared	0.103	0.067	0.092	0.052	0.062	0.052
Mothers and daughters						
Number of observations	15,004	36,162	26,429	51,030	35,667	44,564
Pseudo R-squared	0.102	0.083	0.098	0.071	0.026	0.054

See note and sources at end of table.

Table 4

Probit regressions on the likelihood of self-employment for parents and children, excluding British/French/Canadian groups (concluded)

	Immigrant parents and 1.5 generation	Immigrant parents and second generation	Canadian-born parents and third-and-higher generations
Control variables			
Fathers and sons			
Ethnic group fixed effects	Included	Included	Included
Geographic location effects	Included	Included	Included
Mothers and daughters			
Ethnic group fixed effects	Included	Included	Included
Geographic location effects	Included	Included	Included

* p<0.05
** p<0.01
*** p<0.001
Note: "Renter" is the reference for the homeownership variable; "high school graduate certificate" is the reference for education; "not married" is the reference for marital status; and "neither English nor French" is the reference for mother tongue.
Sources: Statistics Canada, 1981 Canadian Census of Population and 2006 Canadian Census of Population.

With regard to other socio-demographic variables, Canadian experience and being married were positively associated with self-employment rate for both fathers and sons in all three models (Table 2). "Number of children in the family" and "homeownership" were not consistently associated with self-employment, although, in the reduced form probit models, they were positively associated with self-employment for all groups (as in the selection models in Table 5 and Table 6). For parents and children in all three groups, both having children present at home and homeownership were correlated with higher expected earnings differentials between self-employment and paid employment. Thus, the positive association of children and homeownership with self-employment was accounted for by the expected earnings differential.

Education was not monotonically associated with self-employment for all three groups. Having a degree in medicine (also including dentistry, veterinary medicine, and optometry) was strongly associated with a greater likelihood of self-employment. This is not surprising, since professions corresponding to these fields of study have a high level of self-employment. However, other advanced degrees (bachelor degree or graduate degree) were either negatively or not significantly associated with self-employment relative to high school graduation. At the lower end, individuals without any diploma/certificate were generally less likely to be self-employed than those with a high school graduation certificate.

"English/French mother tongue" was negatively associated with the probability of self-employment, except among Canadian-born parents in 1981 (Table 2). Note that controls for ethnic-group fixed effects (British/French is one of the groups) were applied in the model; consequently, this negative relationship should not be interpreted as reflecting a lower self-employment rate among groups with British/French ethnic ancestry. Indeed, such a negative relation existed even when the analysis was replicated without British/French/Canadian groups (Table 4). It is possible that the ability to speak a non-English/French mother tongue in adult life is an indication of attachment to one's ethnic group and of having the potential to use ethnic resources or to reach an ethnic clientele.[19]

For immigrant fathers, both immigrant-specific variables—"Speaks neither English nor French" and "Years of foreign experience"—were significantly associated with self-employment (Table 2, models for the fathers of the 1.5 generation and the second generation). The self-employment rate rose with years of foreign experience. However, foreign experience had a much weaker association with self-employment than Canadian experience. Not being able to speak one of

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19. Note: 'mother tongue' refers to the first language learned at home in childhood and still understood by the individual at the time of census.

Canada's official languages was associated with a lower self-employment rate. This finding corroborates that of other studies which have found that lower proficiency in the host-country language is associated with a lesser likelihood of being self-employed (Lofstrom 2002; Fairlie and Meyer 1996). This suggests that the setting-up and the operating of self-owned businesses often require the ability to speak one or both of the official languages.

There were also clear intergenerational changes in the effects of two other variables on self-employment for women (Table 2). "Years of Canadian experience" is strongly associated with a higher self-employment rate for daughters in 2006, while this relationship is weaker for mothers in 1981, particularly immigrant mothers. "English/French mother tongue" was associated with a higher probability of self-employment among daughters, although such a relationship was not significant among mothers.

5   Discussion and conclusion

This study examines intergenerational changes in the determinants of self-employment among immigrant parents and their children at the same age range 25 years apart on the basis of comparisons of adults in the 2006 Census with their synthetic parents in the 1981 Census. The changes from Canadian-born parents to their children are also examined in order to provide a benchmark of the broad changes in factors affecting self-employment over this 25-year period. The analysis focuses on the effect of three important determinants that likely have different relevance to the Canadian-born, immigrants, and their children: expected earnings differential; difficulties in the labour market; and ethnic enclave. The results suggest that immigrants and their children responded differently to the expected earnings differential and the difficulties in the labour market with respect to the decision to become self-employed.

First, the association of expected earnings differential with individuals' probability of self-employment increased from fathers to their sons. This variable was more strongly associated with the likelihood of self-employment among sons in 2005 than among fathers in 1980 for all three groups. In 1980, a fair share of individuals would have expected an earnings gain when switching from paid employment to self-employment, but this was no longer the case in 2005. It is possible that the increased difficulties in achieving high earnings in self-employment heightened the importance of economic calculations in young men's self-employment decision in 2005. Cross-sectionally, this association was weaker among immigrant fathers than among Canadian-born fathers and weaker among 1.5-generation and second-generation men than among third-and-higher-generation men.

Second, the effect of labour market difficulties decreased over time for young men. Group-specific local employment rates were associated with higher self-employment rates among fathers in all three groups, while this was not the case for their children. One possible reason for the lack of association between labour market difficulties and self-employment rates is that the availability of opportunities for self-employment and the attractiveness of self-employment may have declined for young men, as evident from substantial deterioration in self-employment earnings relative to paid-employment earnings. Thus, although the degree of labour market difficulties remained similar or increased,[20] the response was subdued, since the attractiveness of self-employment was weakened for men. This is consistent with the observation by Kuhn and Schuetze (2001) that the quality of new self-employment, as measured by earnings, full-time

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20. As shown in Table 9, between 1980 and 2005, the group-specific unemployment rate decreased only slightly from immigrant fathers to their 1.5-generation sons, but increased slightly from immigrant fathers to their second-generation sons and from Canadian-born fathers to their third-and-higher-generation sons. Among women, the group-specific unemployment rate decreased in all three groups. Furthermore, the within-group variation in unemployment rates (i.e., by education and region) did not change much between 1980 and 2005 and thus is likely not a factor in the lack of association between self-employment and local market unemployment rates.

status, and the presence of employees, deteriorated for men in the 1980s and in the 1990s, a finding which suggests that self-employment became less attractive to men.

The results of this study suggest that some previous studies have misinterpreted the association between expected earnings differential and self-employment among immigrants. Some studies have interpreted such an association as an indication that low earnings in the paid-employment sector "push" immigrants into self-employment (Clark and Drinkwater 2000; Hammarstedt 2006). However, this study suggests that such an association exists for both immigrant men and non-immigrant men. Furthermore, the association was weaker among immigrants than among their children and the domestic-born. Thus, the expected earnings differential does not capture the difficulties in the paid labour market; rather, it likely reflects the extent to which self-employment is an economically rational choice. Immigrants did not respond to expected earnings differentials in self-employment as strongly as their children and non-immigrants; this finding suggests that difficulties in the paid labour market likely had a stronger "push" effect among immigrants.

Third, group-specific population share, a commonly-used measure of ethnic enclave, was either negatively or non-significantly associated with self-employment among immigrant fathers and their sons. This result is consistent with the findings of other studies that found no support for the hypothesis that ethnic enclaves promote self-employment (Clark and Drinkwater 2000; Yuengert 1995). However, it is possible that self-employment among some non-European ethnic groups involves the provision of ethnic goods and services (e.g., ethnic-food restaurants) and could be more competitive in areas where an ethnic group is concentrated (Razin and Langlois 1996).

The choice of self-employment among young women in 2006 was strongly associated with the expected earnings differential and years of experience, while this was not so among their mothers 25 years previously. Thus, in making the choice of self-employment, young women now take into account the expected earnings differential just as young men do. This is consistent with the broad changes in women's labour force participation and employment patterns (Goldin 2006). Kuhn and Schuetze (2001) also suggested that, contrary to the case with men, improved opportunities in the labour market and the increased attractiveness of self-employment to women are the main reasons for the rise in self-employment among women.

In sum, from immigrant parents to their children, self-employment has evolved into more often the result of choice rather than necessity. This change may partly reflect the well-documented improvement in labour market opportunities over generations in immigrant families. This change is also part of a general trend shared by young adults, whether with or without an immigrant background, although one clearly differentiated by gender.

One limitation of this study is that census data do not contain information on many of the other important determinants of self-employment. For instance, many people enter self-employment not simply for the expected earnings gain, but also for reasons related to entrepreneurial values, including independence, being one's own boss, responsibility, decision making, and creativity. Census data also do not include information on transitions into and out of self-employment and on factors affecting these transitions. Such information would provide a fuller picture regarding whether immigrants and their children choose self-employment for similar reasons.

6   Appendix: Changes in earnings functions of self-employment and paid employment

To derive the expected earnings differential between self-employment and paid employment, which is a focal correlate of self-employment in this study, the employment earnings models

with Heckman selection correction were estimated for self-employed workers and paid workers, respectively. These models are presented in Table 5 for fathers in 1980, in Table 6 for sons in 2005, in Table 7 for mothers in 1980, and in Table 8 for daughters in 2005. In addition to serving as an intermediate step for generating a key variable, these models also reveal important differences and significant changes over time in the earnings functions of self-employment and paid employment.

First, these models show that paid workers and the self-employed have distinct earnings functions. Among fathers in 1980, the earnings functions of paid workers and of the self-employed differed considerably with respect to returns to education and work experience (top panel of Table 5). For instance, a degree in medicine (also including dentistry, veterinary medicine, and optometry) was associated with 75%-to-82%-higher earnings than a high school diploma in paid employment according to immigration status. However, the same degree was associated with negative or non-significant earnings returns among the self-employed; this finding likely reflects the high initial costs of setting up a medical practice since the study sample included only individuals aged 25-to-44. Work experience was associated with large earning returns among paid workers but with no returns among self-employed Canadian-born fathers and with negative returns among self-employed immigrant fathers.

Among mothers in 1980, there were also large differences in the earnings functions between paid workers and the self-employed (Table 7). The returns to education were large among paid workers, but no clear returns were observed among the self-employed. Work experience was associated with higher earnings in paid employment, but not in self-employment. The visible-minority effect was not significant among mothers in paid employment and mothers in self-employment, whereas this effect was significant and negative among fathers in paid employment.

Second, within paid employment and self-employment, the earnings functions were similar for immigrant parents and Canadian-born parents. One exception was that English/French mother tongue was associated with a much larger gain in paid employment and in self-employment earnings among immigrant fathers than among Canadian-born fathers. This is consistent with the findings in the literature that official-language proficiency is one of the most important determinants of earnings among immigrants (Bonikowska et al. 2008). Among young adult workers in 2006, earnings functions were generally similar for 1.5-generation, second-generation, and third-and-higher-generation men. The same also holds among daughters.

Third, there were important changes in earnings functions from fathers to sons within both paid employment and self-employment. Returns to education among both paid workers and the self-employed were stronger among sons than among fathers. This is consistent with the general trend of rising returns to education (Boudarbat et al. 2010). The returns to work experience increased from fathers to sons among paid workers, while they became more negative among self-employed second-generation and third-and-higher-generation men. Visible-minority status was associated with smaller earnings gaps in paid employment among 1.5-generation and second-generation men in 2005 than among their fathers in 1980.

Table 5

Heckman models of employment earnings among male workers by self-employment status, 1980

	Fathers of third-and-higher generations		Fathers of the second generation		Fathers of the 1.5 generation	
	Paid workers	Self-employed	Paid workers	Self-employed	Paid workers	Self-employed
	coefficient					
Variables						
Earnings model						
No diploma/certificate	-0.134 ***	-0.047 **	-0.085 ***	0.166 ***	-0.077 ***	0.152 *
Non-university diploma	0.051 ***	-0.082 ***	0.130 ***	0.087 *	0.135 ***	0.095
Bachelor degree	0.321 ***	0.315 ***	0.307 ***	0.284 ***	0.307 ***	0.212 *
Degree in medicine	0.820 ***	-0.402 ***	0.746 ***	0.072	0.748 ***	-0.127
Graduate degree	0.444 ***	0.571 ***	0.487 ***	0.694 ***	0.475 ***	0.529 ***
Years of potential experience	0.043 ***	0.004	0.032 ***	-0.016 *	0.027 ***	-0.041 **
Experience squared	-0.001 ***	0.000 ***	-0.001 ***	0.000	-0.001 ***	0.001 *
Married	0.091 ***	-0.002	0.067 ***	-0.159	0.016	-0.016
English/French mother tongue	0.000	0.065 *	0.057 ***	0.293 ***	0.079 ***	0.353 ***
Members of visible minority	-0.062 ***	-0.081	-0.182 ***	0.140 ***	-0.229 ***	0.016
Full-time	0.311 ***	0.107 ***	0.454 ***	-0.005	0.400 ***	-0.039
Constant	6.136 ***	8.783 ***	5.920 ***	8.662 ***	6.046 ***	9.018 ***
Selection model						
Number of children	-0.050 ***	0.042 ***	-0.047 ***	0.039 ***	-0.039 ***	0.025 **
Homeowner	-0.343 ***	0.278 ***	-0.140 ***	0.152 ***	-0.215 ***	0.198 ***
No diploma/certificate	-0.060 ***	0.058 ***	0.159 ***	-0.155 ***	0.136 ***	-0.133 **
Non-university diploma	-0.052 ***	0.053 ***	0.051 *	-0.051 *	0.003	-0.006
Bachelor degree	-0.101 ***	0.113 ***	0.099 **	-0.097 **	-0.051	0.059
Degree in medicine	-1.922 ***	1.778 ***	-1.475 ***	1.357 ***	-1.519 ***	1.395 ***
Graduate degree	-0.076 ***	0.091 ***	0.249 ***	-0.232 ***	0.103 ***	-0.091
Years of potential experience	-0.020 ***	0.022 ***	-0.036 ***	0.035 ***	-0.057 ***	0.057 ***
Experience squared	0.000 *	0.000 **	0.001 ***	-0.001 **	0.001 ***	-0.001 ***
Married	-0.014	0.031	0.023	-0.026	0.003	-0.018
English/French mother tongue	0.072 ***	-0.072 ***	0.269 ***	-0.265 ***	0.243 ***	-0.236 ***
Members of visible minority	-0.041	0.041	0.275 ***	-0.270 ***	0.174 ***	-0.177 ***
Constant	1.892 ***	-1.862 ***	1.450 ***	-1.438 ***	1.912 ***	-1.865 ***
/athrho[1]	0.130 ***	-1.425 ***	0.088 ***	-1.449 ***	0.106	-1.529

	Fathers of third-and-higher generations	Fathers of the second generation	Fathers of the 1.5 generation
Control variables			
Earnings model			
Location fixed effects	Included	Included	Included
Selection model			
Location fixed effects	Included	Included	Included

* p<0.05
** p<0.01
*** p<0.001

1. The estimate /athrho is the inverse hyperbolic tangent of the correlation between the error term of the earnings model and the error term of the selection model.

Note: "Renter" is the reference for the homeownership variable; "high school graduate certificate" is the reference for education; "not married" is the reference for marital status; "neither English nor French" is the reference for mother tongue; and "not a member of a visible minority" is the reference for visible-minority status.

Source: Statistics Canada, 1981 Canadian Census of Population.

Table 6

Heckman models of employment earnings among male workers by self-employment status, 2005

Variables	Third-and-higher-generation men		Second-generation men		1.5-generation men	
	Paid workers	Self-employed	Paid workers	Self-employed	Paid workers	Self-employed
			coefficient			
Earnings model						
No diploma/certificate	-0.149 ***	-0.134 ***	-0.140 ***	-0.247 ***	-0.133 ***	-0.217 ***
Non-university diploma	0.182 ***	0.089 ***	0.220 ***	0.120 ***	0.194 ***	0.033
Bachelor degree	0.462 ***	0.446 ***	0.525 ***	0.465 ***	0.528 ***	0.446 ***
Degree in medicine	0.962 ***	-0.607 ***	0.977 ***	-0.182	0.929 ***	-0.177
Graduate degree	0.586 ***	0.610 ***	0.632 ***	0.675 ***	0.659 ***	0.481 ***
Years of potential experience	0.057 ***	-0.048 ***	0.059 ***	-0.035 **	0.062 ***	-0.037 **
Experience squared	-0.001 ***	0.001 ***	-0.001 ***	0.001	-0.001 ***	0.001 *
Married	0.217 ***	-0.086 ***	0.234 ***	0.006	0.188 ***	-0.070
English/French mother tongue	0.053 ***	0.473 ***	0.020 ***	0.119 ***	0.035 ***	0.274 ***
Members of a visible minority	-0.089 ***	-0.008	-0.057 ***	0.165 ***	-0.102 ***	0.099 **
Full-time	0.847 ***	0.597 ***	0.841 ***	0.603 ***	0.811 ***	0.540 ***
Constant	5.156 ***	9.098 ***	5.123 ***	8.707 ***	5.120 ***	8.560 ***
Selection model						
Number of children	-0.034 ***	0.025 ***	-0.029 ***	0.023 ***	-0.023 ***	0.016 **
Homeowner	-0.163 ***	0.129 ***	-0.052 **	0.076 ***	-0.069 **	0.073 ***
No diploma/certificate	-0.055 ***	0.052 ***	-0.120 ***	0.114 ***	-0.046	0.044
Non-university diploma	0.012	-0.007	0.004	-0.003	0.013	-0.012
Bachelor degree	-0.059 ***	0.073 ***	-0.052 *	0.063 ***	0.011	-0.004
Degree in medicine	-1.654 ***	1.532 ***	-1.462 ***	1.356 ***	-1.591 ***	1.472 ***
Graduate degree	-0.100 ***	0.115 ***	-0.049	0.061 *	-0.171 ***	0.193 ***
Years of potential experience	-0.058 ***	0.059 ***	-0.068 ***	0.067 ***	-0.068 ***	0.067 ***
Experience squared	0.001 ***	-0.001 ***	0.001 ***	-0.001 ***	0.002 ***	-0.001 ***
Married	-0.089 ***	0.094 ***	-0.124 ***	0.110 ***	-0.126 ***	0.121 ***
English/French mother tongue	0.234 ***	-0.233 ***	0.043 ***	-0.038 **	0.143 ***	-0.140 ***
Members of a visible minority	0.053	-0.057	0.121 ***	-0.118 ***	0.146 ***	-0.140 ***
Constant	1.862 ***	-1.852 ***	1.938 ***	-1.944 ***	1.808 ***	-1.797 ***
/athrho[1]	0.131 ***	-1.786 ***	0.079 ***	-1.669 ***	0.078 **	-1.587

	Third-and-higher-generation men	Second-generation men	1.5-generation men
Control variables			
Earnings model			
Location fixed effects	Included	Included	Included
Selection model			
Location fixed effects	Included	Included	Included

* p<0.05
** p<0.01
*** p<0.001

1. The estimate /athrho is the inverse hyperbolic tangent of the correlation between the error term of the earnings model and the error term of the selection model.

Note: "Renter" is the reference for the homeownership variable; "high school graduate certificate" is the reference for education; "not married" is the reference for marital status; "neither English nor French" is the reference for mother tongue; and "not a member of a visible minority" is the reference for visible-minority status.

Source: Statistics Canada, 2006 Census of Population.

Table 7

Heckman models of employment earnings among female workers by self-employment status, 1980

	Mothers of third-and-higher generations		Mothers of the second generation		Mothers of the 1.5 generation	
	Paid workers	Self-employed	Paid workers	Self-employed	Paid workers	Self-employed
	coefficient					
Variables						
Earnings model						
No diploma/certificate	-0.119 ***	0.014	-0.091 ***	-0.058	-0.106 ***	0.303 **
Non-university diploma	0.193 ***	-0.081 *	0.152 ***	0.066	0.092 ***	0.006
Bachelor degree	0.492 ***	-0.056	0.332 ***	0.043	0.299 ***	0.222
Degree in medicine	0.937 ***	-1.285 ***	0.785 ***	1.633 ***	0.555 ***	-0.080
Graduate degree	0.623 ***	0.162	0.506 ***	0.105	0.458 ***	0.178
Years of potential experience	0.016 ***	-0.047 ***	0.021 ***	0.014	0.021 ***	-0.044
Experience squared	0.000 ***	0.001 **	0.000 ***	0.000	0.000 ***	0.001
Married	0.045 ***	-0.580 ***	0.015	-0.076	-0.007	-0.479 **
English/French mother tongue	-0.022 **	0.056	0.025 **	-0.114 *	0.042 ***	0.223 **
Members of a visible minority	0.038	0.072	0.010	-0.002	-0.027 *	0.045
Full-time	0.622 ***	0.398 ***	0.573 ***	0.492 ***	0.563 ***	0.379 ***
Constant	5.571 ***	10.720 ***	5.419 ***	5.534 ***	5.404 ***	10.300 ***
Selection model						
Number of children	-0.067 ***	0.031 ***	-0.068 ***	0.070 ***	-0.001	0.000
Homeowner	-0.160 ***	0.188 ***	-0.145 ***	0.140 ***	-0.262 ***	0.180 ***
No diploma/certificate	0.063 ***	-0.031 *	0.193 ***	-0.193 ***	0.180 ***	-0.181 **
Non-university diploma	-0.048 ***	0.065 ***	-0.043	0.043	-0.069	0.068
Bachelor degree	-0.065 ***	0.080 ***	-0.049	0.049	-0.016	0.034
Degree in medicine	-1.611 ***	1.569 ***	-1.333 ***	1.334 ***	-0.949 ***	0.919 **
Graduate degree	-0.177 ***	0.174 ***	-0.054	0.055	-0.012	0.027
Years of potential experience	-0.021 ***	0.028 ***	-0.026 **	0.026 **	-0.040 **	0.042 **
Experience squared	0.000 *	0.000 ***	0.001 **	-0.001 **	0.001 **	-0.001 **
Married	-0.176 ***	0.180 ***	-0.104 *	0.105 *	-0.115 *	0.140 *
English/French mother tongue	-0.005	0.000	0.146 ***	-0.146 ***	0.182 ***	-0.177 ***
Members of a visible minority	0.043	-0.058	0.115 ***	-0.115 ***	0.030	-0.045
Constant	2.356 ***	-2.397 ***	2.145 ***	-2.145 ***	2.240 ***	-2.229 ***
/athrho[1]	-0.563 ***	-1.636 ***	0.007	0.076	0.095 **	-1.694 ***

	Mothers of third-and-higher generations	Mothers of the second generation	Mothers of the 1.5 generation
Control variables			
Earnings model			
Location fixed effects	Included	Included	Included
Selection model			
Location fixed effects	Included	Included	Included

* p<0.05
** p<0.01
*** p<0.001

1. The estimate /athrho is the inverse hyperbolic tangent of the correlation between the error term of the earnings model and the error term of the selection model.

Note: "Renter" is the reference for the homeownership variable; "high school graduate certificate" is the reference for education; "not married" is the reference for marital status; "neither English nor French" is the reference for mother tongue; and "not a member of a visible minority" is the reference for visible-minority status.

Source: Statistics Canada, 1981 Canadian Census of Population.

Table 8

Heckman models of employment earnings among female workers by self-employment status, 2005

Variables	Third-and-higher-generation women		Second-generation women		1.5-generation women	
	Paid workers	Self-employed	Paid workers	Self-employed	Paid workers	Self-employed
	coefficient					
Earnings model						
No diploma/certificate	-0.261 ***	-0.110 ***	-0.210 ***	-0.154	-0.220 ***	-0.279 **
Non-university diploma	0.215 ***	0.066 ***	0.208 ***	0.093	0.202 ***	-0.027
Bachelor degree	0.631 ***	0.643 ***	0.570 ***	0.599 ***	0.599 ***	0.467 ***
Degree in medicine	1.168 ***	2.335 ***	1.173 ***	2.000 ***	1.052 ***	2.031 ***
Graduate degree	0.765 ***	1.033 ***	0.702 ***	0.814 ***	0.737 ***	0.869 ***
Years of potential experience	0.045 ***	0.030 ***	0.062 ***	0.050 **	0.056 ***	0.031
Experience squared	-0.001 ***	0.000	-0.001 ***	-0.001	-0.001 ***	-0.001
Married	0.059 ***	-0.029	0.093 ***	0.016	0.064 ***	0.079
English/French mother tongue	0.055 **	-0.115	0.005	-0.041	0.029 ***	-0.045
Members of a visible minority	-0.022	0.020	0.011	0.024	-0.036 ***	0.000
Full-time	0.693 ***	0.501 ***	0.717 ***	0.542 ***	0.698 ***	0.540 ***
Constant	5.210 ***	4.889 ***	5.179 ***	4.750 ***	5.130 ***	4.858 ***
Selection model						
Number of children	-0.055 ***	0.060 ***	-0.024 **	0.033 ***	-0.040 ***	0.044 ***
Homeowner	-0.128 ***	0.110 ***	0.136 ***	-0.014	-0.082 **	0.069 **
No diploma/certificate	-0.020	0.018	-0.040	0.104 *	-0.087 *	0.085 *
Non-university diploma	-0.089 ***	0.091 ***	-0.087 ***	0.084 ***	-0.053 *	0.054 *
Bachelor degree	-0.039 ***	0.041 ***	-0.173 ***	0.169 ***	-0.184 ***	0.185 ***
Degree in medicine	-1.620 ***	1.620 ***	-1.560 ***	1.694 ***	-1.837 ***	1.837 ***
Graduate degree	-0.181 ***	0.183 ***	-0.238 ***	0.252 ***	-0.383 ***	0.385 ***
Years of potential experience	-0.072 ***	0.071 ***	-0.064 ***	0.071 ***	-0.077 ***	0.077 ***
Experience squared	0.002 ***	-0.002 ***	0.001 ***	-0.001 ***	0.002 ***	-0.002 ***
Married	-0.132 ***	0.135 ***	-0.131 ***	0.142 ***	-0.137 ***	0.139 ***
English/French mother tongue	0.145 ***	-0.144 ***	-0.007	0.024	0.062 **	-0.062 **
Members of a visible minority	0.059	-0.061	0.066 **	-0.065 **	0.087 ***	-0.088 ***
Constant	2.233 ***	-2.227 ***	2.191 ***	-2.438 ***	2.494 ***	-2.488 ***
/athrho [1]	0.048	0.132	-0.820 ***	0.096	0.047	0.119

Control variables	Third-and-higher-generation women	Second-generation women	1.5-generation women
Earnings model			
Location fixed effects	Included	Included	Included
Selection model			
Location fixed effects	Included	Included	Included

* p<0.05
** p<0.01
*** p<0.001

1. The estimate /athrho is the inverse hyperbolic tangent of the correlation between the error term of the earnings model and the error term of the selection model.

Note: "Renter" is the reference for the homeownership variable; "high school graduate certificate" is the reference for education; "not married" is the reference for marital status; "neither English nor French" is the reference for mother tongue; and "not a member of a visible minority" is the reference for visible-minority status.

Source: Statistics Canada, 2006 Canadian Census of Population.

Table 9

Changes in correlates of self-employment

	Immigrant parents and 1.5 generation		Immigrant parents and second generation		Canadian-born parents and third-and-higher	
	Parents	Children	Parents	Children	Parents	Children
			mean			
Men						
Group-specific unemployment rate	0.070	0.065	0.043	0.051	0.042	0.060
Group population share	0.689	0.474	0.190	0.142	0.222	0.144
Number of children	2.035	1.089	2.094	1.216	2.383	1.278
Home-owner	0.780	0.725	0.760	0.812	0.715	0.757
No diploma/certificate	0.352	0.126	0.307	0.064	0.300	0.100
Non university diploma	0.322	0.433	0.382	0.399	0.389	0.376
Bachelor degree	0.082	0.143	0.096	0.214	0.089	0.205
Degree in medicine	0.007	0.004	0.014	0.011	0.018	0.012
Graduate degree	0.047	0.051	0.092	0.085	0.095	0.074
Years of work experience	16.393	15.373	17.529	13.970	18.889	14.113
Married	0.981	0.678	0.987	0.591	0.979	0.597
English/French mother tongue	0.975	0.994	0.407	0.687	0.495	0.415
Women						
Group-specific unemployment rate	0.093	0.064	0.079	0.056	0.079	0.071
Group population share	0.670	0.481	0.195	0.144	0.206	0.150
Number of children	1.934	1.229	2.043	1.267	2.258	1.404
Home-owner	0.764	0.736	0.760	0.807	0.701	0.762
No diploma/certificate	0.355	0.076	0.393	0.032	0.445	0.062
Non university diploma	0.314	0.439	0.303	0.386	0.277	0.393
Bachelor degree	0.063	0.196	0.089	0.275	0.066	0.243
Degree in medicine	0.001	0.005	0.006	0.010	0.005	0.012
Graduate degree	0.021	0.068	0.045	0.112	0.037	0.090
Years of work experience	15.905	14.816	17.453	13.289	19.318	13.792
Married	0.883	0.699	0.920	0.617	0.897	0.611
English/French mother tongue	0.972	0.994	0.455	0.656	0.500	0.434

Sources: Statistics Canada, 1981 Canadian Census of Population and 2006 Canadian Census of Population.

The changes in earnings functions from mothers to daughters were similar to those observed from fathers to sons. There were large increases in returns to education, particularly among the self-employed from mothers to daughters. While there were no returns to education among self-employed mothers in 1980, returns to education among self-employed daughters were even larger than those among daughters in paid employment and those among sons in paid employment and sons in self-employment. Returns to work experience also increased from mothers to daughters, although returns were still smaller among the self-employed than among paid workers.

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